

## AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

### Listing of Claims:

- 1        1. (Currently amended) A computer controlled method to construct a secure credential  
2                infrastructure comprising steps of:  
3                        exchanging key commitment information over a preferred channel between a  
4                credential issuing device and a prospective member device to pre-authenticate said  
5                prospective member device, wherein said preferred channel has both a  
6                demonstrative identification property and an authenticity property;  
7                        receiving a public key from said prospective member device;  
8                        verifying said public key with said key commitment information; and  
9                        automatically provisioning said prospective member device with a credential  
10                authorized by a credential issuing authority.
- 1        2. (Original) The computer controlled method of claim 1, further comprising establishing  
2                proof that said prospective member device is in possession of a private key  
3                corresponding to said public key.
- 1        3. (Original) The computer controlled method of claim 2, further comprising establishing  
2                a communication channel between said prospective member device and said  
3                credential issuing authority responsive to the step of establishing proof.
- 1        4. (Original) The computer controlled method of claim 3, wherein said credential is  
2                secret and said communication channel is a secure communication channel.

- 1 5. (Original) The computer controlled method of claim 1, further comprising configuring  
2 said credential issuing authority.
- 1 6. (Original) The computer controlled method of claim 1, wherein said credential issuing  
2 device includes said credential issuing authority.
- 1 7. (Original) The computer controlled method of claim 1, wherein the step of exchanging  
2 further comprises sending network configuration information to said prospective  
3 member device.
- 1 8. (Original) The computer controlled method of claim 1, wherein the step of  
2 automatically provisioning further comprises steps of:  
3 determining provisioning information for said prospective member device; and  
4 sending said provisioning information to said prospective member device.
- 1 9. (Original) The computer controlled method of claim 8, wherein said provisioning  
2 information further comprises application-specific configuration information.
- 1 10. (Original) The computer controlled method of claim 1, wherein said preferred channel  
2 is a location-limited channel.
- 1 11. (Original) The computer controlled method of claim 1, wherein said preferred channel  
2 uses a telephone switching system.
- 1 12. (Canceled).
- 1 13. (Original) The computer controlled method of claim 1, wherein said key commitment  
2 information is selected from one or more of the group consisting of a portion of said  
3 public key, said public key, an encoding of said public key, and a mathematical  
4 function of said public key.

- 1 14. (Original) The computer controlled method of claim 1, wherein the step of  
2 automatically provisioning is performed by said credential issuing device.
- 1 15. (Original) The computer controlled method of claim 1, wherein the step of  
2 automatically provisioning is performed by an enrollment station in communication  
3 with said credential issuing device.
- 1 16. (Original) The computer controlled method of claim 15, wherein the method further  
2 comprises establishing secure communication between said enrollment station and  
3 said credential issuing device.
- 1 17. (Original) The computer controlled method of claim 1, wherein said prospective  
2 member device is selected from one or more of the group consisting of a computer,  
3 a personal data assistant, a smart card, a cryptographic token, a medical device, a  
4 device containing personal information, a secure telephone, a cell telephone, a  
5 vehicle, a container, an access card, a biometric sensor, a wireless network device, a  
6 proximity sensor, a sensor device, traffic sensor, an alarm device, a robot, a device  
7 capable of receiving a credential, a device capable of issuing a credential.
- 1 18. (Original) The computer controlled method of claim 1, wherein said secure credential  
2 infrastructure is a public key infrastructure, said credential issuing authority is a  
3 certification authority and said credential is a public key certificate.
- 1 19. (Original) The computer controlled method of claim 18, wherein the step of  
2 automatically provisioning further comprises steps of:  
3 determining provisioning information for said prospective member device;  
4 creating a public key certificate as said credential responsive to said  
5 provisioning information; and  
6 sending said public key certificate to said prospective member device.

1 20. (Original) The computer controlled method of claim 18, wherein the step of  
2 exchanging further comprises steps of:  
3 creating a public key pair for said prospective member device; and  
4 sending said public key pair to said prospective member device over said preferred  
5 channel.

1 21. (Original) The computer controlled method of claim 18, further comprises steps of:  
2 creating a trusted key pair;  
3 storing said trusted key pair;  
4 establishing a certification authority public key certificate; and  
5 storing said certification authority public key certificate.

1 22. (Original) The computer controlled method of claim 21, wherein the step of  
2 automatically provisioning is responsive to authorization from a registration agent.

1 23. (Currently amended) A computer-readable storage medium storing instructions that  
2 when executed by a computer cause the computer to perform a method to construct  
3 a secure credential infrastructure, the method comprising steps of:  
4 exchanging key commitment information over a preferred channel between a  
5 credential issuing device and a prospective member device to pre-authenticate said  
6 prospective member device, wherein said preferred channel has both a  
7 demonstrative identification property and an authenticity property;  
8 receiving a public key from said prospective member device;  
9 verifying said public key with said key commitment information; and

10 automatically provisioning said prospective member device with a credential  
11 authorized by a credential issuing authority.

1 24. (Original) The computer-readable storage medium of claim 23, wherein said public  
2 key is received over said preferred channel.

1 25. (Original) The computer-readable storage medium of claim 23, wherein the step of  
2 automatically provisioning further comprises steps of:

3 determining provisioning information for said prospective member device; and

4 sending said provisioning information to said prospective member device.

1 26. (Original) The computer-readable storage medium of claim 23, wherein the step of  
2 exchanging is initiated by said prospective member device.

1 27. (Original) The computer-readable storage medium of claim 23, wherein the step of  
2 exchanging is initiated by said credential issuing device.

1 28. (Original) The computer-readable storage medium of claim 23, wherein the step of  
2 automatically provisioning is performed by said credential issuing device.

1 29. (Original) The computer-readable storage medium of claim 23, wherein said  
2 prospective member device is selected from one or more of the group consisting of  
3 a computer, a personal data assistant, a smart card, a cryptographic token, a  
4 medical device, a device containing personal information, a secure telephone, a cell  
5 telephone, a vehicle, a container, an access card, a biometric sensor, a wireless  
6 network device, a proximity sensor, a sensor device, traffic sensor, an alarm device,  
7 a robot, a device capable of receiving a credential, a device capable of issuing a  
8 credential.

1 30. (Original) The computer-readable storage medium of claim 23, wherein said secure  
2 credential infrastructure is a public key infrastructure, said credential issuing  
3 authority is a certification authority and said credential is a public key certificate.

1 31. (Currently amended) A credential issuing apparatus configured to construct a secure  
2 credential infrastructure comprising:

3 at least one port configured to establish a preferred channel, wherein said  
4 preferred channel has both a demonstrative identification property and an  
5 authenticity property;

6 a key commitment receiver mechanism configured to receive key commitment  
7 information ~~through said at least one port~~ over said preferred channel;

8 a key receiver mechanism configured to receive a public key;

9 a pre-authentication mechanism configured to verify said public key with said  
10 key commitment information; and

11 a credential provisioning mechanism configured to be able to automatically  
12 provide a credential authorized by a credential issuing authority responsive to the  
13 pre-authentication mechanism.

1 32. (Original) The apparatus of claim 31, wherein said public key is received over said  
2 preferred channel.

1 33. (Original) The apparatus of claim 31, further comprising a key-pair validation  
2 mechanism configured to establish proof that a prospective member device is in  
3 possession of a private key corresponding to said public key.

1 34. (Original) The apparatus of claim 31, further comprising an initialization mechanism  
2 configured to configure said credential issuing authority.

- 1 35. (Original) The apparatus of claim 31, wherein said credential issuing device further  
2 comprises said credential issuing authority.
- 1 36. (Original) The apparatus of claim 31, further comprises a network device  
2 configuration mechanism configured to send network configuration information  
3 over said preferred channel.
- 1 37. (Original) The apparatus of claim 31, wherein the credential provisioning mechanism  
2 further comprises:  
3 a determination mechanism configured to determine provisioning information  
4 for said prospective member device; and  
5 a transmission mechanism configured to send said provisioning information to  
6 said prospective member device.
- 1 38. (Original) The apparatus of claim 31, wherein said key commitment information is  
2 selected from the group consisting of a portion of said public key, said public key,  
3 an encoding of said public key, and a mathematical function of said public key.
- 1 39. (Original) The apparatus of claim 31, wherein the credential issuing device is an  
2 enrollment station capable of being in communication with said credential issuing  
3 authority.
- 1 40. (Original) The apparatus of claim 33, wherein said prospective member device is  
2 selected from one or more of the group consisting of a computer, a personal data  
3 assistant, a smart card, a cryptographic token, a medical device, a device  
4 containing personal information, a secure telephone, a cell telephone, a vehicle, a  
5 container, an access card, a biometric sensor, a wireless network device, a  
6 proximity sensor, a sensor device, traffic sensor, an alarm device, a robot, a device  
7 capable of receiving a credential, a device capable of issuing a credential.

1 41. (Original) The apparatus of claim 31, wherein said secure credential infrastructure is a  
2 public key infrastructure, said credential issuing authority is a certification authority  
3 and said credential is a public key certificate.

1 42. (Original) The apparatus of claim 41, wherein the credential provisioning mechanism  
2 further comprises:

3 a services determination mechanism capable of determining provisioning  
4 information for a prospective member device;

5 a certificate creation mechanism configured to create a public key certificate as  
6 said credential responsive to said provisioning information; and

7 a sending mechanism capable of sending said public key certificate to said  
8 prospective member device.

1 43. (Original) The apparatus of claim 41, wherein the key commitment receiver  
2 mechanism further comprises:

3 a key creation mechanism capable of creating a public key pair for a  
4 prospective member device; and

5 a sending mechanism capable of sending said public key pair to said  
6 prospective member device over said preferred channel.

1 44. (Original) The apparatus of claim 41, further comprising an automatic configuration  
2 mechanism comprising:

3 a key pair creation mechanism configured to create a trusted key pair;

4 a key pair storage mechanism configured to store said trusted key pair;

5 a public key certificate generation mechanism configured to establish a  
6 certification authority public key certificate responsive to said trusted key pair; and



7 a certificate storage mechanism configured to store said certification authority  
8 public key certificate.

1 45. (Original) The apparatus of claim 44, wherein the public key certificate generation  
2 mechanism further comprises a parent CA receiver mechanism configured to  
3 receive said certification authority public key certificate from a parent certification  
4 authority.

1 46. (Original) A credential issuing apparatus configured to construct a secure credential  
2 infrastructure comprising:

3 at least one port configured to establish a preferred channel;

4 a key commitment receiver mechanism configured to receive commitment  
5 information for a secret through said at least one port;

6 a key receiver mechanism configured to receive said secret;

7 a pre-authentication mechanism configured to verify said secret with said  
8 commitment information; and

9 a credential provisioning mechanism configured to be able to automatically  
10 provide a credential authorized by a credential issuing authority responsive to the  
11 pre-authentication mechanism.

12  
1 47. (Currently amended) A computer controlled method to join a prospective member  
2 device with a secure credential infrastructure comprising steps of:

3 exchanging key commitment information over a preferred channel between a  
4 credential issuing device and said prospective member device, wherein said  
5 preferred channel has both a demonstrative identification property and an  
6 authenticity property;

7 receiving a public key by said prospective member device;  
8 verifying said public key with said key commitment information; and  
9 receiving a credential authorized by a credential issuing authority.

1 48. (Original) The computer controlled method of claim 47, further comprising  
2 establishing proof that said credential issuing device is in possession of a private  
3 key corresponding to said public key.

1 49. (Original) The computer-controlled method of claim 48, further comprising  
2 establishing a communication channel between said prospective member device and  
3 said credential issuing authority responsive to the step of establishing proof.

1 50. (Original) The computer controlled method of claim 47, wherein said secure credential  
2 infrastructure is a public key infrastructure, said credential issuing authority is a  
3 certification authority and said credential is a public key certificate.

1 51. (Original) The computer controlled method of claim 47, wherein said preferred  
2 channel is a location-limited channel.

1 52. (Original) The computer controlled method of claim 47, wherein said preferred  
2 channel uses a telephone switching system.

1 53. (Canceled).

1 54. (Original) The computer controlled method of claim 47, wherein the step of  
2 exchanging is initiated by said prospective member device.

1 55. (Original) The computer controlled method of claim 47, wherein the step of  
2 exchanging is initiated by said credential issuing device.

1 56. (Original) The computer controlled method of claim 47, wherein said key commitment  
2 information comprises a portion of said public key.

1 57. (Original) The computer controlled method of claim 47, wherein said key commitment  
2 information comprises a function of said public key.

1 58. (Original) The computer controlled method of claim 50, further comprising receiving a  
2 public key pair by said prospective member device.

1 59. (Original) The computer controlled method of claim 47, further comprising receiving  
2 provisioning information by said prospective member device.

1 60. (Original) The computer controlled method of claim 47, wherein said prospective  
2 member device is selected from one or more of the group consisting of a computer,  
3 a personal data assistant, a smart card, a cryptographic token, a medical device, a  
4 device containing personal information, a secure telephone, a cell telephone, a  
5 vehicle, a container, an access card, a biometric sensor, a wireless network device, a  
6 proximity sensor, a sensor device, traffic sensor, an alarm device, a robot, a device  
7 capable of receiving a credential, a device capable of issuing a credential.

1 61. (Currently amended) A computer-readable storage medium storing instructions that  
2 when executed by a computer cause the computer to join a prospective member  
3 device with a secure credential infrastructure, the method comprising steps of:  
4 exchanging key commitment information over a preferred channel between a  
5 credential issuing device and said prospective member device, wherein said  
6 preferred channel has both a demonstrative identification property and an  
7 authenticity property;  
8 receiving a public key by said prospective member device;

9                    verifying said public key with said key commitment information; and

10                   receiving a credential authorized by a credential issuing authority.

1        62. (Original) The computer-readable storage medium of claim 61, wherein said preferred  
2                   channel uses a telephone switching system.

1        63. (Original) The computer-readable storage medium of claim 61, wherein the step of  
2                   exchanging is initiated by said prospective member device.

1        64. (Original) The computer-readable storage medium of claim 61, wherein the step of  
2                   exchanging is initiated by said credential issuing device.

1        65. (Original) The computer-readable storage medium of claim 61, wherein said key  
2                   commitment information comprises a function of said public key.

1        66. (Original) The computer-readable storage medium of claim 61, wherein said  
2                   prospective member device is selected from one or more of the group consisting of  
3                   a computer, a personal data assistant, a smart card, a cryptographic token, a  
4                   medical device, a device containing personal information, a secure telephone, a cell  
5                   telephone, a vehicle, a container, an access card, a biometric sensor, a wireless  
6                   network device, a proximity sensor, a sensor device, traffic sensor, an alarm device,  
7                   a robot, a device capable of receiving a credential, a device capable of issuing a  
8                   credential.

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1        67. (Currently amended) An apparatus capable of joining a secure credential infrastructure  
2                   comprising:

3 at least one port configured to establish a preferred channel, wherein said  
4 preferred channel has both a demonstrative identification property and an  
5 authenticity property;

6 a key commitment receiver mechanism configured to receive key commitment  
7 information ~~though over said preferred channel at least one port;~~

8 a key receiver mechanism configured to receive a public key;

9 a pre-authentication mechanism configured to verify said public key with said  
10 key commitment information; and

11 a credential receiving mechanism configured to receive a credential responsive  
12 to the pre-authentication mechanism.

1 68. (Original) The apparatus of claim 67, further comprising a key-pair validation  
2 mechanism configured to establish proof that a credential issuing device is in  
3 possession of a private key corresponding to said public key.

1 69. (Original) The apparatus of claim 68, further comprising a network interface  
2 configured to establish a communication channel with a credential issuing authority  
3 responsive to the key-pair validation mechanism.

1 70. (Original) The apparatus of claim 67, wherein said secure credential infrastructure is a  
2 public key infrastructure, said credential issuing authority is a certification authority  
3 and said credential is a public key certificate.

1 71. (Original) The apparatus of claim 67, wherein said preferred channel is a location-  
2 limited channel.

1 72. (Canceled).

1 73. (Original) The apparatus of claim 67, wherein said key commitment information  
2 comprises a portion of said public key.

1 74. (Original) The apparatus of claim 67, wherein said key commitment information  
2 comprises a function of said public key.

1 75. (Original) The apparatus of claim 70, further comprising a receiving mechanism  
2 capable of receiving a public key pair.

1 76. (Original) The apparatus of claim 67, further comprising a receiving mechanism  
2 capable of receiving provisioning information.

1 77. (Original) The apparatus of claim 67, further including one or more components  
2 selected from the group consisting of a computer, a personal data assistant, a smart  
3 card, a cryptographic token, a medical device, a device containing personal  
4 information, a secure telephone, a cell telephone, a vehicle, a container, an access  
5 card, a biometric sensor, a wireless network device, a proximity sensor, a sensor  
6 device, traffic sensor, an alarm device, a robot, a device capable of receiving a  
7 credential, a device capable of issuing a credential.

1 78. (New) A computer controlled method to construct a secure credential infrastructure  
2 comprising steps of:

3 exchanging key commitment information over a preferred channel between a  
4 credential issuing device and a prospective member device to pre-authenticate said  
5 prospective member device;

6 sending network configuration information over said preferred channel to said  
7 prospective member device;

8 receiving a public key from said prospective member device;

9 verifying said public key with said key commitment information; and

10 automatically provisioning said prospective member device with a credential  
11 authorized by a credential issuing authority.

1 79. (New) A computer-readable storage medium storing instructions that when executed  
2 by a computer cause the computer to perform a method to construct a secure  
3 credential infrastructure, the method comprising steps of:

4 exchanging key commitment information over a preferred channel between a  
5 credential issuing device and a prospective member device to pre-authenticate said  
6 prospective member device;

7 sending network configuration information over said preferred channel to said  
8 prospective member device;

9 receiving a public key from said prospective member device;

10 verifying said public key with said key commitment information; and

11 automatically provisioning said prospective member device with a credential  
12 authorized by a credential issuing authority.